

THE AMERICAN JOURNAL
...OF...
OPHTHALMOLOGY.

VOL. XVI.

APRIL, 1899.

NO. 4.

ORIGINAL ARTICLES.

SIMPLE GLAUCOMA IN A GIRL SIXTEEN YEARS
OF AGE; OPERATION: IRIDECTOMY;
FAVORABLE RESULT.*

BY S. C. AYRES, M.D., CINCINNATI, OHIO.

GLAUCOMA is essentially a disease of middle life. Priestley Smith, in his exhaustive analysis of 1000 cases, finds that of these 293 occurred between 50 and 60, and 290 between 60 and 70, showing that about 58 per cent. occurred during those two decades, and but 9 per cent. between 70 and 80, and 20 per cent. between 40 and 50. Under 20 the liability of glaucoma is only about one-half of one per cent.

There are certain symptoms of this dreaded disease which can be easily recognized. In the acute cases we have the hazy cornea, the dilated pupil, the increased intra-ocular tension, the severe neuralgic pain, and the impaired vision. In the simple cases we have the dilated pupil, the increased tension, the contracted visual field, the deep excavation of the optic discs, the pulsating central retinal artery, and the gradual failure of vision and blanching of the optic nerves.

Volumes have been written to show why this disease occurs more frequently in middle life and advanced years. Priestley Smith has shown that the lens increases perceptibly as we advance in years and on this has proposed a theory that the enlarged lens presses on the lymph-channels in such a way

*Read before the Academy of Medicine of Cincinnati, Ohio.

as to interfere with the normal intra-ocular circulation. The corneal diameter, the refraction of the eye, the condition of the sclera, the blood vessels of the internal ocular tissues, and many other points have all been most carefully studied and commented upon, and every effort has been made to find the cause of this dangerous disease. It is not my object now to discuss these interesting points but simply to recite the history of a case which is rather unusual—a case of glaucoma occurring in a girl 16 years of age. It is a case in which the subjective and objective symptoms of this disease were as plainly marked as if she were 60 instead of 16 years of age.

Priestley Smith, in his Erasmus Wilson Lecture on Glaucoma, says that "the liability to primary glaucoma is extremely slight in childhood and youth as compared with the later periods of life"; thus at 15 years of age it is at least one hundred times smaller than at 65. In the 1000 cases tabulated by him the liability to glaucoma was only one-half of one per cent. under 20 years of age. The literature on the subject contains numerous reports of glaucoma under 20 years of age, a few of which I quote:

Dr. Randolph, of Baltimore, reports a case of glaucoma simplex in a mulatto girl, 11 years of age. It presented all the symptoms characteristic of this disease in advanced life.

Dr. Harlan, of Philadelphia, observed a very remarkable case of hereditary glaucoma in a family. His patient was 18 years of age, and her mother had lost her sight from the same disease at the age of 19, and the maternal grandfather at the age of 18. The great-grandmother on the mother's side, and the great-great-grandfather also became blind from the same cause. This disease occurred also in early life in members of the collateral branches of the same family.

Gallenga, of Turin, published in 1886, an exhaustive clinical report of 332 cases of glaucoma, treated at the clinic of Turin. Among these, two cases occurred in persons between the ages of 10 and 19 years.

Nettleship, in "*R. L. O. H.*," Vol. XII, reports four cases in persons under 20 years of age.

Brailey, in the "*Transactions of the Ophthalmological Society of Great Britain*," 1890, reports a case in a girl, 18 years of age.

Story (*Ophthalmic Review*, Vol. XII) reports a case in a girl, 18 years of age.

Schmidt-Rimpler, in the *Graefe-Saemisch Handbuch*, reports a case in a girl, 9 years of age (Stellwag), a boy of 12 (Schirmer), and a boy of 16 and one of 19 by Mooren.

A few years ago I saw a girl, 18 years of age, in the St. Mary's Hospital of this city, who had chronic glaucoma in both eyes. The tension was increased, and there was a deep excavation of the optic discs, the pupils were moderately dilated, the fields were contracted, and in fact the eyes presented all the subjective and objective symptoms of glaucoma as seen in advanced years. She was highly myopic and had worn glasses for several years. The dangers of the disease were fully explained and the operation of iridectomy proposed, but to this her parents would not consent, and she left the hospital.

This case, with the one I am about to report in detail, are the only ones I have seen in person under 20 years of age.

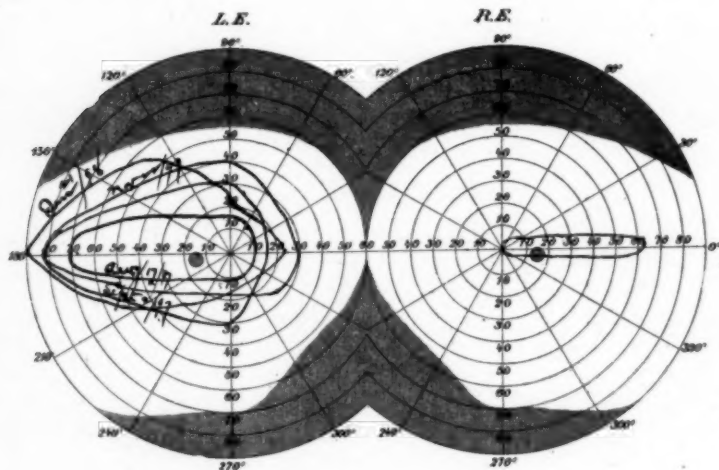
My case is as follows: Miss C., 16 years of age, was first seen by me August 17, 1897. She is a bright, healthy, well-developed girl. Her parents are both living and have good eyes, and there is no history of glaucoma in the family. She stated that two years previously the right eye began to have attacks of dimness which at first passed off without impairing the sight, but that gradually vision failed, until now the eye is almost blind. Recently the vision of the left eye has failed and she fears it may go as the right one did.

The eyes are well developed, corneæ of normal diameter, and irides healthy in appearance. The pupils are moderately dilated, the right one not responsive to light and the left one responds very sluggishly. Tension of each eye is + 1. In the right eye the optic disc is deeply excavated and blanched, vision is only equal to shadows of the hand.

The optic disc of the left eye is also deeply excavated but presents a fairly healthy appearance, vision = 0.4, with M. 1 D. \ominus Am. $0.75^\circ + 90$, V. = 0.9. The field of vision of the right eye is reduced to a narrow streak or line running horizontally. It is about 60° long and 10° wide and entirely on the temporal side. The field of the left eye is considerably larger, being about 10° in the nasal side and 70° in the temporal side and

about 30° in width. A solution of salicylate of eserine gr. $\frac{1}{6}$ ad \mathfrak{z} ss was ordered to be instilled twice a day.

She was next seen September 7, when a considerable improvement was marked. With the right eye she could count fingers at $3'$ and with the left eye $V. = 1$ with full correction. The eserine had a happy effect on the eyes and the tension was reduced to almost normal. The field of vision of the right eye was not enlarged but that of the left had expanded considerably as is shown by the diagram. She was directed to continue the use of the eserine as before and to abstain from all use of her eye.



On November 22, the field of the left eye had broadened out still more on both temporal and nasal sides, as well as in the upper and lower fields. The right eye was about the same, no improvement being noted.

January 8, 1898. Eyes about the same. On January 21, the right eye was reduced to perception of shadows, and with the left eye she had a vision of only 0.8, a marked failure in vision since her last visit. The eyes were feeling uncomfortable but not painful. Pain as a symptom had been quite absent from the first, but now she was aware that her left eye was more clouded and hazy than it ever had been.

I had used the eserine up to this time, as the field of the left eye had gradually enlarged and the tension was held down about to the normal point. But now a change was apparent.

The field of the left eye had begun to contract and the eye was in an uncomfortable condition. Feeling that the eserine had accomplished all that it could and fearing to treat it longer I proposed operation of iridectomy, to which a ready assent was given.

On January 21, 1898, under chloroform anæsthesia, I made an iridectomy upward in each eye. The operation was not attended by any unusual complications. The iris was found thick, fleshy and adherent to the iris-angle. The next day the eyes were free from reaction but the anterior chambers were both empty. The incisions did not fully close until January 28, seven days after the operation. Eyes were sensitive to light but vision fairly good.

February 7. A small cystoid cicatrix has formed in each incision. Eyes still sensitive to light but otherwise comfortable. Tension normal in both and vision in the left eye very satisfactory, but no test was made with her glasses.

She returned home and was again seen March 8. The right eye was still slightly sensitive to light but the left one was free from any irritation. Tension of the right eye was about normal with a suspicion of a tendency to plus tension, left eye tension normal. The vision of this eye with M. 3 D. \ominus Am. 1 D. ax. 90 V. = 0.8.

April 9. M. 4 D. V. = 0.9.

May 18. M. 2.5 \ominus Am. 1 D. ax. 20 V. = 1.

September 17. V. = 0.9 with the same lenses.

This record of her refraction shows the changes which took place after the operation. Her myopia was first 3 D., then 4 D., and finally 2.5 D., where it now stands. The myopic astigmatism increased only from 0.75 to 1 D., but the angle changed from 90° to 20°. If she had been seen earlier it is very probable that the right eye might have been saved also.

The occurrence of glaucoma in a girl 16 years of age conflicts somewhat with the theories which explain its manifestations so well in middle life, but that it does occur is certain.

INTRA-OCULAR HÆMORRHAGE SUBSEQUENT TO
CATARACT EXTRACTION AND IRIDECTOMY.

BY J. S. JOHNSON, M.D., ANN ARBOR, MICH.

STIMULATED by Dr. B. E. Fryer's article in the February, 1899, number of this Journal, and with the desire to contribute to more complete statistics of post-operative intra-ocular hæmorrhage, I will report two cases which have recently occurred under my observation in the clinics of the Michigan University Hospital.

CASE I.—Mr. E. W., 71 years of age, American, came to the hospital November 28, 1897, with a mature senile cataract in his right eye. Vision in the eye began to fail four years before and the history of the development was entirely devoid of anything unusual. He had never had any pain, light perception and projection was good, and the eye appeared in every respect normal and healthy and a favorable one for operation. After the usual preparation of the patient, the operation was performed November 29, at 2 P.M., under cocaine. I made the usual corneal incision upward, including about two fifths of the circumference and close to the scleral junction. A small iridectomy was made and the lens easily extracted without any difficulty, accident or complication of any kind. At the time of operation there was not the least hæmorrhage, either from the sclera or iris, nor any bulging or gaping of the wound, and vision was good, the patient readily and correctly counting and designating fingers. After the usual toilet and bandaging the patient was sent to his bed in the ward. About six hours afterward the patient began to complain of pain in his eye and as this increased very much in severity, I was sent for. Not being at home, I did not arrive for nearly two hours more, at which time the patient informed me that the pain had mostly disappeared, but that the dressings were wet. Inspection showed them to be soaked with blood and vitreous, and through the widely gaping corneal wound protruded a plug of clotted blood, vitreous and membrane looking like capsule and retina. This plug was cut off, the eye irrigated and dressed, and the wound healed with a very much shrunken eye. There was no further hæmorrhage and not much pain.

The patient was a large plethoric man with a florid face, whose radial arteries were hard and evidently diseased. I have been informed that the patient died some months afterward from cerebral hæmorrhage. I am fairly well satisfied that he received no injury to his eye to cause the hæmorrhage. The other eye was, apparently, perfectly healthy, except that the lens showed incipient cataract.

Here, then, was a case of hæmorrhage, apparently spontaneous, occurring six hours after a perfectly smooth cataract extraction. The somewhat protracted period of severe pain before the appearance of blood would indicate that the source of the hæmorrhage was back in the fundus, most probably between the retina and choroid, and that with the rupture of the posterior capsule and evacuation of the effused blood with the consequent relief of pressure, the severity of the pain abated. The presence of diseased blood vessels and the plethoric habit suggest explanations of the unfortunate accident.

My other case was one of absolute glaucoma, in which an iridectomy was done mainly with a view to relieve the pain, and has this in common with the first case, that the hæmorrhage occurred some considerable time subsequent to the operation.

CASE II.—Ira W., 39 years of age, American, farmer, came to the hospital September 29, 1898. Right eye was normal in all respects. Vision in the left eye had gradually failed during last year, so that five weeks prior to this date, he could barely count fingers. Four weeks before, an attack of severe pain came on, with redness of the eye, and since then occasional slighter attacks. During last four days, constant severe pain. Eye somewhat red and all appearance of glaucoma with tension considerably increased and vision limited to light perception. Patient below medium size, thin, and general health not very good. That same afternoon a large iridectomy upward was made, after which there was slight bleeding from the iris with some tendency to gaping of the corneal wound. The eye continued painful, but the wound closed. I visited him once or twice every day, and on October 3, at 9 A.M., he complained of very severe pain, so much so that the question of enucleation was discussed. I saw him again at 1 P.M., when the wound had reopened and through it had discharged the fractured lens, most of the vitreous, and a plug made up of retina, iris, capsule

and coagulated blood protruded through the corneal wound. I immediately enucleated the eye. The source of the hæmorrhage was clearly not from the cut edges of the iris but from the fundus of the eye between the retina and choroid. In this case the result was not entirely unexpected, and prophylactic measures, such as morphia, eserine, cold applications, and pressure-bandage were adopted without avail.

THE ETIOLOGY AND IMPORTANCE OF IRITIS.*

BY HEMAN H. BROWN, M.D., CHICAGO, ILL.,

PROFESSOR OF DIDACTIC AND CLINICAL OPHTHALMOLOGY, ILLINOIS MEDICAL
COLLEGE, CHICAGO.

ONE of the noteworthy features of ophthalmic literature of the past few years, and one that must appeal to anyone whose attention is directed to it, is the comparative neglect of one of the most frequent, and certainly one of the most important of ocular disorders—iritis. When we take note of the vast amount of recent literature on the more strictly surgical diseases of the eye, the disparity becomes the more apparent, and while not under-rating the worth of investigations of the latter class of affections, one is inclined to ask, have not the diseases of the iris, an organ more complex anatomically and functionally, not less important, a still greater relative importance? It is not because our knowledge of diseases of the iris is complete, for such is far from being the case. It includes, I believe a rather larger proportion of dubious or unsettled questions than does that of some of the more frequently discussed disorders. There is certainly room and need of study in this particular line, and therefore it is to some aspects of the etiology and pathology of iritis that I wish to call your attention.

When we examine the structures of the eye from without inward, passing from the external eye backward, we find the iris the first actively functioning organ, and the most complex in its structure. Its relative importance, judging from

*Read at the Fourth Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at New Orleans, La., February 10-11, 1899.

these facts, ought to be apparent, and it is not inferior to that of any other structure as regards its normal and its pathologic activities. The slightest disorder, a mere hyperæmia of this excessively vascular organ, is immediately reflected, so to speak, on the external ocular membrane, so that mistakes of diagnosis are frequent, and sometimes disastrous. Then, too, its internal relations with the deeper tunics of the eye render it still more important. The iris, besides its motor function, which it shares with the ciliary body, is, like the latter, an anterior extension of the vascular tunic of the globe of the eye which is completed by the choroid from behind, and this continuity of tissue naturally suggests a common pathology, at least in active inflammatory conditions, and therefore acute iritis almost necessarily involves more or less implication of the deeper tissues of the uveal tract, it can hardly be unaccompanied with some degree of cyclitis and choroiditis. I say hardly, because this is yet to some extent a disputed question, and I am constantly more impressed with the uncertainty of our knowledge on this point and of the impropriety of saying positively in any given case that it is solely an iritis or a cyclitis, for both organs are supplied by the same blood vessels and lymphatics, and bathed alike in the same aqueous solution. It is true, we can conceive of an acute primary cyclitis and a secondary iritis, the circulatory media coming first in contact with the ciliary body, but how are we to conceive of the ciliary body becoming impregnated with inflammatory products without involving also the iris. An independently existing cyclitis is therefore improbable, and a primary iritis without a co-existing cyclitis may be possible, but is hardly probable. The involvement of the choroid follows the same rule, as its connection with the ciliary body is even more direct than that of the latter with the anterior section of the uveal tract, the iris.

The systemic or general disturbances that accompany or follow the derangement of this most important and functionally widely related organ are also an index of its importance. There is no other ocular disorder that is more painful, or that more quickly reacts upon the organism in general in producing general febrile disturbance, for how frequently are we surprised, when the thermometer is used, to note the marked elevation of temperature with an apparent slight iritis. In this respect it is almost unique amongst the local diseases of the

eye. The iris is, moreover, one of the organs that are directly attacked in systemic morbid states, not merely infectious diseases where the germs or their products seek out points of least resistance to do their evil work, though it is especially vulnerable to some of these, but it appears to particularly share in some disorders induced by auto-intoxication from deranged general metabolism as, for instance, in rheumatism or gout, or through some as yet imperfectly understood disturbance of the central nervous system, as in diabetes. Exactly how the toxins engendered in these conditions reach the iris to make it the point of selection for their attack is not clear, but the fact is they do reach it, and its involvement is a marked feature of these and many other affections. In 144 cases of diabetes, Galezowski (*Jahrb. f. Augenh.*, 1883, page 297), quoted by Knies, found iritis in 7 cases, or nearly 5 per cent. of the total. The iritis of rheumatism is so well known and so marked a complication that its consideration will be taken up more *in extenso* later in this paper.

To me, one of the most interesting and suggestive subjects connected with the pathology of this organ, however, is that of sympathetic ophthalmia. We are all well aware that when one eye is injured, and the lesion extends to or involves the so-called danger zone or ciliary region, there is apt to follow an involvement of the other eye, beginning with the well-known ciliary disturbance and coincident iritic involvement, and in many cases true plastic irido-choroiditis in the fellow eye, and rapidly extending to other parts, causing complete functional destruction of the second eye. Assuming, as some do, that this is due to an infection traveling, let us say, by the route of the optic nerve, ciliary reflex or circulation, the fact that it first acts on the iris or ciliary body is a curious one. Why should it at first pass by the corresponding ciliary body to the iris to involve the ciliary body secondarily, or *vice versa*? Is it because the iris is, through some sympathetic disorder of innervation, not yet ascertained or theoretically explained, rendered especially vulnerable to germs of disease in such cases? It is not necessary to assume the presence of microbic germs to explain a non-suppurative inflammation, but the carriage of their toxins even in this case is difficult to reason out, especially if we have also the puzzling problem of their elective affinities to solve. If we confine the consideration to the

possibility of merely toxin infections, we have difficulties enough; but they are more easily met from a theoretic point of view than are those of the actual transmission of the germs from the originally infected eye, which has been seriously argued to account for sympathetic ophthalmia with its iritic involvement. We know that microbes travel through the blood vessels and the lymphatics, and that many even of the pathogenic forms are our constant parasites, but are harmless for evil unless they can find a weakened point for their attack, and even then, often without complete success. For instance, the tubercle bacillus asserts its presence to a certain extent, even on that especially fatal field, the lung, in a large proportion of the human species. It is estimated by some that as high as two or three of every five young persons have suffered at some time in their lives from latent tuberculosis (*Brit. Med. Jour.*, 1898, Kelsch, on "X-Ray and Tuberculosis,") and from which the great majority suffered no serious consequences. It is not remarkable, therefore, that there should be microbes found in iritic inflammation, but their presence alone does not necessarily prove their causal connection with it. They may be simply taking advantage of a condition found ready at hand. The discussion, therefore, as to the actual microbic origin of sympathetic ophthalmia, while leaving the matter undecided as to the facts, is less important, as in no case could the question be positively settled without tracing actual inflammatory action by some route, either that of the optic nerve (?), the one most suspected means, or some other as yet unknown. It is far easier, therefore, and it may be fully as rational, to suppose some trophic influence acting first through the nervous system preparing the way, or even setting up the actual lesions, than to assume the propagation of either microbes themselves, or even their products directly from one eye to the other. However, we may leave the subject of sympathetic ophthalmia, it is nevertheless one of the puzzles of ophthalmologic practice, and is full of suggestively open questions, yet it is a clear demonstration of the pathologic importance of the iris and its inflammation.

Another feature of iritis that gives its importance among eye disorders is the pain and discomfort it produces. There is no other ocular affection, except possibly some extreme cases of acute glaucoma (?), that can compare with iritis in this re-

spect. This fact also would be sufficient, it would seem, to call attention to it more frequently, for while we may have exceptional cases of insidious progress—"quiet iritis" of Jonathan Hutchinson—the most ordinary symptom is pain, and this may be and often is most excruciating. Whether this pain be neuralgic or due to tension, as is usually the case, it is a serious symptom in itself, and one that alone ought, it would seem, to call more frequent attention to this disease in the literature of ophthalmology.

In what has been already said, the importance of iritis has, I think, been shown, and while much more could be offered, enough has been suggested to demonstrate that the existing comparative neglect of the subject is not justified by any lack on its part of clinical or pathologic interest. While the etiology of the disorder has already been alluded to in one or two regards, it is so important a subject from a practical point of view, and one that is also still so unsettled in some respects that it deserves some discussion.

I have already spoken in regard to the question of actual bacterial and of toxic infection, and expressed the opinion that the former is not essential, and when it is demonstrated may be a secondary condition. A question suggests itself, Can we have a purely neurotic iritis, one in which direct infection either by bacteria or their toxins does not exist, and which is due to reflex trophic irritation? Such an iritis would probably not remain long uninfected, but I see no reason for denying its existence, and, as already suggested, it seems to me a natural mode of accounting for the puzzling facts of sympathetic diseases of the iris and ciliary body. And, again, the cases of iritis occurring in connection with neuralgic affections and the association with it of herpes zoster, as not infrequently found, are also suggestive in this connection, for there is no question as to the neurotic origin of the inflammation of herpes, however much infected with bacteria its lesions may later become. Sufficient proof have we, however, of a neurotic origin for certain forms of iritic irritation, that valuable time can yet be spent in investigation in this direction.

Taking, however, the well-established causes of iritis in which infection can be assumed, we find the first place occupied by a syphilitic disease, the germ or toxin of which has neither yet been satisfactorily isolated, and yet one that seems

to act especially through an intoxication of the system. The percentage of iritis due to this cause varies from 42 per cent. (Nettleship) to 70 per cent. by different authors (De Wecker), and we can probably estimate it with safety as the exciting cause of more than half the total number of cases of iritis that occur. This is in some respects a favorable fact, to be sure, for it is from this cause the more amenable to treatment, and, furthermore, syphilis is in general an avoidable disease by the individual. On the other hand, only a small proportion of syphilitic cases suffer from iritis. Seggel (*Archiv. f. Augenh.*, IX, 254), for example, found only 4 cases in 382 of constitutional syphilis, or only slightly over one per cent. It would appear that it is with all its frequency a rather infrequent complication, and is indirectly, therefore, a bad indication, as showing the great prevalence of syphilis. Iritis from rheumatism, which is generally estimated as next in frequency, though very much less frequent, is not like the preceding so much an individually avoidable disease, and its comparative lesser frequency taken with the very general prevalence of rheumatic affection is therefore fortunate, as it indicates that it must be a rarer complication of rheumatism than of syphilis. Clemens, of Berlin (1882) gives the remarkable estimate of 9 per cent. of all cases in the ophthalmological department of the Charité Hospital, Berlin, while Nettleship, in 1883, stated that 33 per cent. of all cases of iritis were rheumatic in origin, but from a large number of authors on this subject we feel warranted in estimating rheumatism to be the cause of a large number of cases of iritis, and from the very oscillating and manifestly obscure rheumatic symptoms, and our present knowledge of rheumatism increasing daily, as it is, I am led to feel that the per cent. of rheumatic iritis will be increased in the future, as there is perhaps no common disease confronting the medical man to-day more perplexing than rheumatism, and more obscure in its manifestation in many cases. The peculiarities of rheumatic iritis are well known; it is generally bilateral, and is probably the most painful of all types of the disorder, and likewise the most rebellious, and inclined to relapse on the least provocation. In many instances it is the first manifestation of the rheumatic diathesis, or the signal of an approaching rheumatic arthritis, and its recurrence appears occasionally to occur independent of any marked rheumatic symptoms. It is

not remarkable, however, that this should be so, since with the tendency once well established, the sensitive structure of the iris would readily relapse under the irritation of the toxins present. Until we know positively of a rheumatic germ and its habits, it is only speculation to assume it or any other form lying latent in the iris structure to revive its activities under fresh stimuli. That rheumatic iritis is directly infectious, however, would seem to be indicated by the experiments of Ahls-tröm (*Centbl. f. Augenh.*, 1896, page 95), who inoculated the eyes of healthy rabbits under all precautions with a bit of rheumatic iris, and reproduced the disease, while control-experiments from glaucoma and catarrh were negative.

Syphilis and rheumatism are the two best known and most frequently recognized causes of iritis, and it is a notable fact that they both belong to a class of disorders that are supposed to act by producing a general dyscrasia, or intoxication of the organism, and that in neither of them has the original infective germ been satisfactorily proven to exist. It is true that discoveries of it have been claimed, but they are not yet recognized or proven to general satisfaction; while we know perfectly well that in both a systemic poisoning takes place. The same is true, to a certain extent, with diabetes, which was mentioned earlier in this paper as responsible for a certain proportion of cases. We may call acute rheumatism an infectious disease, but it is not so easy to admit all the forms of chronic rheumatic and gouty affections to the same category, yet they may all, or most of them at least, produce iritis.

Syphilitic and rheumatic iritis, including probably over three-quarters of all cases, therefore, are suggestive of questions that can only be referred to here—questions that are yet unsettled in the etiology of iritis.

There are some interesting problems also connected with the iritis from infections that are well demonstrated as bacterial. Why, for example, should disease of the uveal tract be so infrequent or absolutely unknown in connection with so many other equally infectious disorders is a point of interest, and suggests a line of research that might be profitably followed up.

The germ diseases causing iritis in which the actual discovery of the microbe has been made in the inflamed iris are not numerous, the usual organisms found are merely the ordi-

nary cocci of suppuration. Tuberculosis has been microscopically identified, and tuberculous iritis may be considered a well-established type, and the frequency of tuberculosis renders this a very important fact. Gonorrhœal iritis is probably diagnosed on the *post hoc* principle in many cases, but it probably exists, and, indeed, Krassnig has recently (*Woissnow Med. Jour.*, November, 1897) reported finding the gonococci in the pus from an iritis occurring the twenty-eighth day of a gonorrhœal urethritis. An interesting case in my own experience in connection with this subject was that of a young man whom I treated on two different occasions for iritis of the right eye. The iritis at each time mentioned was not severe, but with no previous history of rheumatism or syphilis. At each time I treated him for iritis he was suffering from gonorrhœa, and complained of constant pain and suffering in the right knee-joint. A question yet remains in my mind as to the cause of his iritis in the absence of microscopical findings. Might this be classed gonorrhœal? Leprosy is said to be a frequent cause of iritic inflammation, according to Lopez (*Archiv. f. Augenh.*, XXII, 1890, 318), advanced leprosy nearly always affects the iris. This, however, with us, being a less-frequently found malady, concerns us less. Many other disorders are reported as occasionally complicated with iritis, among them malaria, which is especially characterized by its tedious course, and in which Bradley states two especially characteristic features, namely, its periodicity and proneness to recurrence; typhus and typhoid, varicella, influenza, and some cases have been reported as due to trigeminal neuralgia (Gould), and to suppurative affections of the nasal passages (Ziem, Fage). In some of these cases the diagnosis was apparently only by exclusion, and in all of them the disorder may be conceded as rare and exceptional, except probably in influenza, where hyperæmia of the iris is said to be frequent (Knies, "The Eye in General Diseases," page 394). In speaking of influenza, I would state that at this time I have in charge a young woman, 22 years of age, who, upon recovery from influenza—apparently not severe in its nature—noticed her right eye to be very red, and two days later on rising in the morning was much surprised to find her pupil obscured completely by a yellow film and the eye blind. The patient at this time was in Memphis, Tenn. She returned immediately to Chicago, and I was called to see her.

I found the anterior chamber partially filled with pus, which resulted from an iritis. This was one week ago. At this time the pus has entirely disappeared, but the vitreous is very cloudy. I mention this in detail as it is much in keeping with this subject, bearing upon the relation of iritis to influenza.

We can summarize, I think, the facts that have been actually acquired as to the etiology of iritis as follows:

1. A majority of all cases, ranging from 55 to 65 per cent. are due to syphilis, and a smaller proportion, varying according to different estimates from 10 to 20 per cent., may be accredited to arthritic toxins. The small percentage left is caused by various constitutional and infective disorders, with also a strong probability of the existence occasionally of a true sympathetic or neurotic iritis entirely distinct in its origin from any infectious process whatever. Traumatic iritis, except as it may indirectly give rise to the last-named form, is here unconsidered; its mechanical origin places it out of the scope of the present paper.

2. There is a wide range for speculation as to the mode of action of infections on the iris, but at the present time the facts point to the action of bacterial products or toxins rather than to that of the germs themselves. In only a few affections have the characteristic bacteria been found directly in the inflamed iris; in others only the ordinary pus cocci are present to indicate a secondary infection.

In what has been said, I have endeavored to invite attention to the importance of iritis, and to some yet unsettled question of its etiology. It is, in my belief, one of the most important, if not actually the most important, of all ocular affections. Ophthalmology, treating as it does of an organ that is primarily an optical physical apparatus, obeying the laws that govern the transmission of light, should be one of the most exact of medical specialties, but we must not forget that there is hardly any phase of pathology or any primary pathologic process that may not be in action in diseases of the eye. Iritis is an affection that does not appeal directly to our surgical instincts, and it is therefore necessary that we should be as ophthalmologists, physicians as well as surgeons. There is certainly no eye disorder that is more full of interesting problems and suggestions, and none, it is probable, that when fully and properly studied, is of greater promise as regards our therapeutic control.

THE BEST VISION AFTER CATARACT EXTRACTION.*

BY W. E. DRIVER, M.D., NORFOLK, VA.,

U. S. EXAMINING SURGEON—EYE AND EAR SURGEON, HOSPITAL ST. VINCENT
DE PAUL, NORFOLK HOSPITAL, NORFOLK & WESTERN R. R., SEABOARD
AIR LINE R. R., ATLANTIC & DANVILLE R. R.

IN presenting this subject it is not my desire nor do I intend to enter into each and every phase of cataract extraction. I simply wish to bring to your notice the methods I have found approximately satisfactory in obviating the most common complications arising in the first few days after the extraction of a mature senile cataract. And I will for convenience take them in the order of their frequency, believing it the most satisfactory way of getting at what I have to say. I wish to emphasize though, as a preliminary remark, that in a given case (that is, everything else being equal) I have found the best vision after simple extraction without iridectomy. By the best vision I not only mean the most acute, but the vision with the greatest range from far to near point, as well as laterally, and the vision that is most lasting. In doing the simple operation then, our emergencies are, *Iritis*, *Hernia of Iris*, and *Suppuration*.

Iritis.—Most of the true iritis occurs in those persons with either a rheumatic diathesis or some real manifestation of the disease; this though might be so trivial as not to cause the patient the slightest concern or inconvenience. Here, too, I have a slight digression. This form of inflammation of the iris (the microbic cause of rheumatism not being isolated), gives us an example of another form of inflammation than that defined by Professor Senn, of Chicago. I do not know his views as to the etiology of rheumatism.

To avoid rheumatic iritis following cataract extraction, it is self-evident that our patient should be as free as possible of this disease before the operation. The patient that comes from a distance as well as the one at home—instead of being promis-

*Read at the Fourth Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at New Orleans, La., February 10-11, 1899.

cuously operated upon the day after the consultation, is rigidly quizzed as to whether he had ever had any of the forms of rheumatism, or if he has any symptoms of the disease at present, thus, endeavoring to gain, to a greater or less extent, a knowledge of the patient's physical condition. Patients with only a history, but no active symptoms of the disease, I give anti-rheumatics in moderate doses for a few days, and then operate. Patients with the slightest active demonstration of the disease are sent back to their homes to take energetic anti-rheumatic treatment. This the family physician sees to and when in his opinion the patient is in a good condition and ready to return for an operation informs me of the fact. I take pains to instruct the family physician as to my desires that he may know when to intelligently return the patient to me for an operation. It always means several weeks after the symptoms have disappeared. When they come into my hands the second time they are given, before and after the operation, in fact, the whole time they are in the hospital, saline, saline waters, and lithia water. I take care, too, not to operate unless the weather is favorable. If you avoid rheumatic iritis I can assure you there will but seldom be any other form of iritis to treat after your mature lens extractions.

Again, we must obviate microbic iritis (inflammation this side of suppuration). This, now inexcusable disease, notwithstanding the advance in aseptic surgery, still claims its share of victims. It is inexcusable I say and surely it is as we all recognize, unless the infection comes from within through the general circulation. This though is far from being common, the exception here does not prove the rule. It is more than likely that our patient has either not been properly prepared, or has been infected by the assistant's or operator's hands, drugs, water, instruments, or dressing.

As before said, the patient is always sent to the hospital, where he has the routine bath (general). After that the face, and as much of the head as possible, eyelids, and hands are scrubbed up thoroughly with soap and water. I find convenient for making the eyelashes and lids clean a soft bristle tooth brush; it answers the purpose admirably. Then the same parts are washed off with alcohol and ether—taking care not to get any of the soap or alcohol mixture into the eye. Thirdly, this is washed off with sterilized water. The eye to be operated

upon is dressed with a 1-6000 bichloride of mercury solution, using sterilized dressings. After the eye has been bandaged up the nurse is instructed to drop, every three hours, enough of the same solution of bichloride of mercury on to keep the pad wet. The pad is removed every four hours and a fresh one supplied, and at the same time several drops of the 1-6000 solution are dropped into the eye—in short, the eye is practically irrigated when it is re-dressed. Say, my patient enters the hospital one evening, as he generally does, he is operated upon the morning of the second day. Operator's and assistant's hands are scrubbed thoroughly to the elbow with green soap and water. The soap is then washed off with hot sterilized water, and the hands are immersed for five minutes in a 1-1000 bichloride solution, when they are again rinsed in sterilized water to remove the bichloride. The cocaine is made up with distilled water. The bottle, and pipette forming the stopper, all are thoroughly sterilized before and after the solution is made. Only sponges of sterilized cotton are used, and the water is always either boiled or distilled. As to the instruments, I prefer boiling them in distilled water to which has been added a little biborate soda (borax), to any other method of sterilizing them. I do not think the ingenious apparatus for using formaldehyde, originated by my friend, Dr. Reik, of the Johns Hopkins Hospital, altogether as safe a method as their immersion in boiling water. There is but little or no deleterious effect on the edge of the instruments from the five minutes' immersion in the boiling water. Instruments with ivory handles are soon demolished, and those with aluminium handles do not stand the soda, so I prefer to have all handles made of German silver. I do not credit the habit of simply sterilizing the blades, as I find a great many of the physicians doing, the handles as well as blades should be thoroughly sterilized. All the dressings to be used at the operation and for re-dressings are sterilized for one hour in an ordinary Arnold steam sterilizer. In other words, you will observe that my preparations are very much of the same manner as those of the clean general surgeon who is preparing to do a laparotomy.

Still another condition that comes under this head, but can not be correctly called an iritis, is the union between the raw surfaces of the iris and capsule, forming a posterior synechia. This is a well-recognized condition and has been demon-

strated by a number of surgeons. Taking my choice, I prefer a capsular cataract to a posterior synechia. I am therefore more than careful how I rupture the lens-capsule. With a great many others, I never remove the anterior portion of the capsule with the so-called capsular forceps of Schweigger or Förster. I use a bent cystotome, the cutting edge of which is on the convex side. It is of the greatest importance that the cutting surface of the knee should be extremely sharp, so that the capsule is cut instead of being torn. I introduce the cystotome into the anterior chamber, with the knee to the temporal side. The point of the instrument goes under the iris at the most dependent part of the capsule, the knee is turned down, and with the cutting edge an incision is made vertically to the corneal flap, extending to the lower edge of the upper portion of the iris. The cystotome is then withdrawn in the same manner as introduced, taking care not to injure the iris. Thus the capsule is freely opened, and after the lens has been expelled, curls under so that the cut edges do not come in juxtaposition with the more or less lacerated iris. During the expulsion of the lens it is more than probable that the rent in the capsule is made complete or extended well up under the iris. As a further preventative to any synechia that might form, or iritis, forty-eight hours after the operation two drops of sterilized solution, four grains to the ounce, of sulphate of atropine is instilled into the eye—that is, if the pupil is found central. In forty-eight hours more, two drops of the atropine solution are again instilled into the eye. The atropine is then kept up once a day until the pupil is well dilated, and there is no tendency to iritis or synechia.

Hernia.—The first step to prevent hernia of the iris is to have the patient absolutely quiet during the operation. To do this you must have the entire confidence of the patient; but to secure a more placid state even that this can give, it is my habit to give the patient one-half hour before operation twenty-five grains of bromide of soda. This can do no harm, though it surely aids the patient to more easily control himself, and fix the eye upon a given point. To insure absolute quiet, that the patient may have no jar, or be called upon for any muscular movement during, or after the operation, a suitable bed is selected for the operation. Dr. H. Knapp, of New York, thinks this precaution of but little use (and speaks of it as making

virtue of a necessity). Other men though are using the bed instead of the operating table and consider it an absolute necessity to their armamentarium. The bed I use is for individual convenience made in the following manner: The frame-work is of one and one-half inch white enamel hollow tubing set on five inch rubber-tire castors. The width of the bed is forty-two inches, and from the floor to the top of mattress is thirty-four inches. The head of the bed is made removable. The

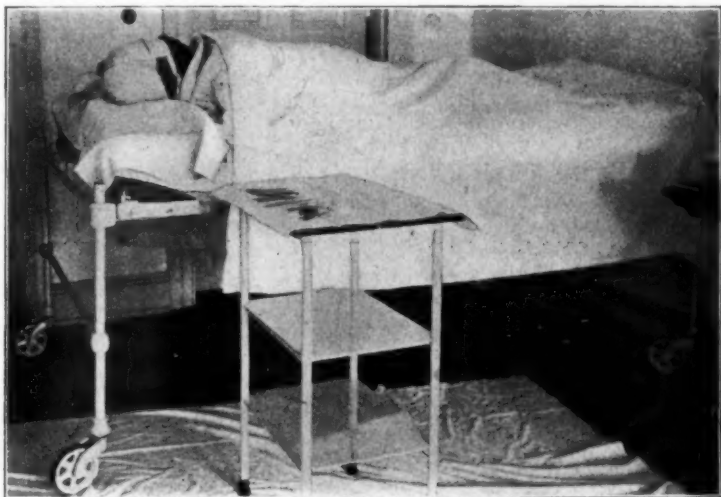


FIG. 1.—Showing Bed Before Operation.

large castors enable the bed to be easily moved to the operating room, or to the source of light, and back to the darkened room where the patient is to remain, without the slightest jar. No man, how well he can operate, is justified in allowing his patient to walk up or down two or three flights of stairs to his room from the operating table, or even to be carried on a stretcher.

After operating, the removal of the speculum is of great importance. It should be done in such a way that the upper jaw of the speculum does not come in contact with the corneal flap, such an entanglement would be sure to elevate its free edge, and reduce the desired apposition of the two surfaces. The upper lid, too, should not be allowed to close immediately over the eye. For, in a large percentage of cases it would

press the corneal flap over and thus invite a hernia. I obviate both of these conditions by taking the handle of the speculum in my right hand, and with a slight upward movement elevate the lid and at the same time catch a number of the lashes of the upper lid between the thumb and forefinger of the left hand, holding the upper lid stationary to the brow. The speculum is then closed and removed, after which the corneal flap, if necessary, is adjusted with the spatula. The upper lid is

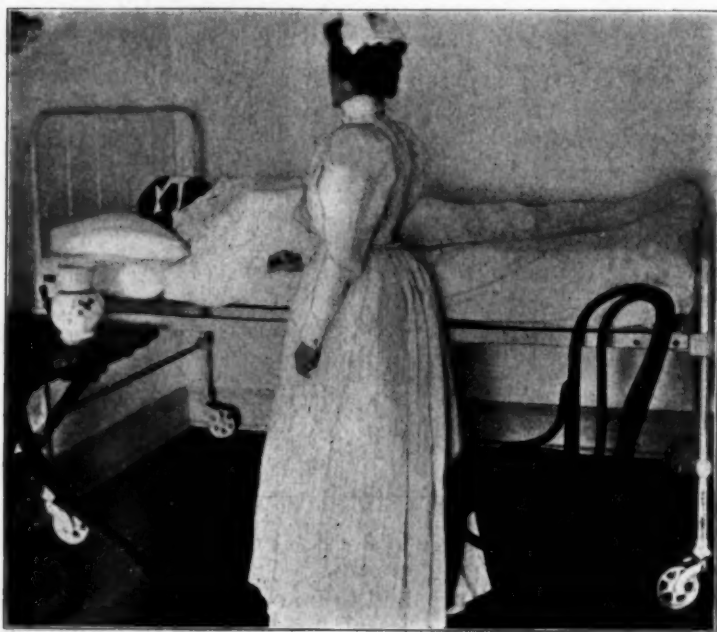


FIG. 2—Showing Bed After Operation.

then lifted over the corneal wound, and the patient is told to keep both eyes closed. The lids are good splints and if kept closed will keep the corneal flap in the desired position. I consider it always necessary to bandage both eyes. This is done with the figure 8-bandage with two long and two short tapes. The patient is then rolled into the darkened room, and taken charge of by a specially trained nurse. A good nurse can do more to prevent hernia than all the devices, such as hoods, tea-strainers, and contrivances of this kind in existence. I consider all appliances of this class worthless and worse than

useless, and will never use them again, so long as a nurse is to be had. When I leave my patient I have no great anxiety about hernia. I warn him to keep his eyes closed, and assure him that the nurse will do everything that is necessary for his comfort. The nurse not only sees to every comfort, but is held responsible for every movement of the patient as long as it is deemed necessary. The patient is fed by the nurse, thus obviating one of the most common ways of using the eye after the operation, for the operated eye will, to a greater or less extent, take the same motions as the eye that has not been operated upon. Further, too, the nurse sees that the patient does not, during his sleep, disturb the dressings, or in any way strike the eye with his hands or bed-clothing. The patient moves in bed only enough to remove the tiring of one position. The bowels are kept moderately active, and the patient is not allowed to sit up, but uses the bed-pan; there must be no straining and the patient is constantly reminded of this by the nurse. If there is any other pain to cause the patient the slightest discomfort the nurse is instructed to give a mixture of bromide and chloral. This removes the pain, quiets the patient, and produces normal sleep. I find this mixture also very useful to relieve that constant desire to urinate after the operation in old men that have some form of prostatitis. If there is no other pain than that attributed to the operation the eye is not opened for inspection for thirty-six hours, and it is then that I expect to find a round central pupil. In a certain number of cases we have hernia induced by the *vis a tergo*, fortunately though, this is an unwonted condition. So far, I know not when to expect it, or how to prevent it.

As a striking example of this form of hernia, I will cite a case that came under my observation some years since, when I was resident surgeon at the Presbyterian Hospital, Baltimore. A patient of Dr. Julian J. Chisolm, Miss W., 47 years of age, was operated on for mature senile cataract, without iridectomy, had no complications, and was discharged from the hospital two weeks after the operation as cured. Nineteen days after discharge she had re-opening of the corneal wound and hernia of the iris, causing her return to the hospital. There was no history of injury or contusion of any kind.

After the operation I do not use eserine. It might be a good thing were it not for its tendency to precipitate an iritis.

Therefore, I do not use it. I take other precautions, to some they may seem unnecessary, but I do not feel so far that I am doing an unnecessary thing or using too much care.

Suppuration.—What has been said as to the preventative of microbic iritis also applies to suppuration of the corneal wound. I failed to say, though, that the sheets and pillow-cases are thoroughly sterilized. Owing to the darkness of the room, in which the cataract patient is to remain, we have to use extra precautions in keeping it thoroughly clean. It is but seldom that it can be given a real good sunning, which goes a long ways towards making a room clean. My rooms for cataract patients and other plastic work are made clean and kept clean, and no infected or suppurated cases are ever put in there. My fear of suppuration is now limited to very old persons, it is in them that we are most apt to have a slough. I use every method to improve their general nutrition. Their diet should not only be the most nutritious, but should be slightly stimulating. Milk-toddies I give quite freely. While I seldom use preparatory drugs I find pepto-mangan (Gude's) is well borne and does good, and in these cases I prefer it to the other preparations.

SOME EXPERIMENTS WITH THE GIANT MAGNET.*

BY HAMILTON STILLSON, M.D., SEATTLE, WASH.

THE writer had hoped to include in this paper the report of some experiments on the influence of the force of magnetism upon the composition of photographic plates. The series of experiments in that line are not yet completed. The report of them will have to be deferred. Enough has been accomplished, however, to induce us to hope that with a suitable plate, a suitable magnet, and a suitable object, results can be obtained from magnetism which will compare somewhat favorably and will resemble somewhat the effects of the X-ray in producing shadowgraphs upon photographic plates; and the writer mentions his uncompleted experiments at this time

* Read at the Fourth Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at New Orleans, La., February 10-11, 1899

only in the hope of stimulating others to experimentation on this subject.

Many other perhaps more practical and certainly more easily conducted experiments also need to be made with the giant magnet, for instance, determining the proper manner of manipulating the magnet in the extraction of paramagnetic foreign bodies from the interior of the eye. For, as a matter of fact, results from the use of the small hand magnet and results from the use of the giant magnet have, until to-day, been far from a realization of the reasonable hopes entertained by oculists possessing such magnets. Surely everyone who has had experience in the use of the giant magnet has been surprised at the often untoward reaction following its use.

From the series of experiments whose detailed account would unnecessarily burden this paper, and from observations on the behavior of the magnet and the attracted foreign body in actual office operation, the writer would make the following conclusions:

1. The field of magnetization extending from the tip of the magnet, and appreciated by the vibration of a small magnetic needle, is about 10 meters varying, of course, with variations of the current.

2. The actual working distance is usually contact of the eye with the magnet.

3. With the eye at a distance of five millimeters from the tip of the magnet, and with six or eight ampères of current, the magnetic force will be about 130 gm.; multiplying the distance by three divides the force by seven.

4. Dividing the weight of the object by *two* divides the attraction by *six* if the object be iron, and by about *four* if the object be steel.

5. A paramagnetic body, as iron or steel, becomes a magnet upon being attracted by a magnet and assumes opposite poles. Not only should the shape of the foreign body be recognized as fully as possible before operation, but the operator should determine what position he would prefer it to be in for extraction and which end he would desire to come first.

6. Usually the best line to use is the line that radiates from the tip of the magnet. In Fig. 1 the directions of the lines of force from the magnet are indicated by knitting-needles which have been attracted into the positions represented in

the figure. This central line of force should be applied to the long diameter of the foreign body, if possible, in such a way as to place the foreign body in the position most favorable for extraction.

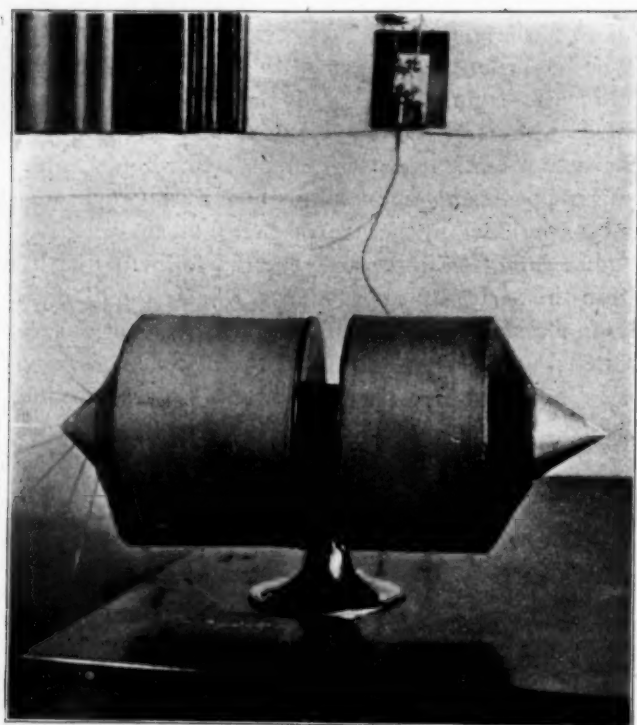


FIG. 1.

7. The management of the foreign body will depend more upon its shape than is generally believed. If the object be disc-like, it should be made to saw its way with the edge forward; if it be pyramidal, the point should be extracted first.

8. To accomplish this purpose the eye and the magnet should be relatively in position and still before the current is turned on. It is a mistake to place the patient at a distance and cause him to approach the magnet gradually.

9. A rheostat should generally be used with the current, especially if the body be large. Only a very slight current should be attempted at first or until the piece of steel is made to assume a position easy for its accouchement. The placing

of the foreign body, it may be said again, in proper position for making its exit, is of as much importance as is the proper presentation of the infant at parturition.

10. Knapp says that foreign bodies in the vitreous are arranged by preference in the lower part of the vitreous, but experiments tend to show that this will depend upon the size and shape of the foreign body, the length of time it has been in the vitreous, and the character of the vitreous. For instance, blood in the vitreous will well up and float the foreign body towards the point of exit of the blood. This will be especially the case if the piece be small (less than 0.02 gm.). Then, too, if the piece be small, and the vitreous somewhat fluid, the foreign body if given time may sink. The vitreous humors of different eyes differ greatly as to their liquidity. If the vitreous be not especially fluid a small piece may float where it first lodged.

11. Small pieces with great difficulty penetrate so far as the vitreous; a piece weighing less than 0.02 gm. will often stop in the cornea or sclera. Great force is required to cause such a piece to pass on through the lens or through the sclera. They will often be caught in the iris, especially if the iris is somewhat distant from the lens. They seem to be caught by the iris as a falling acrobat is caught by his net, or the fish is caught by the seine.

In two of my cases in practice the large pieces had passed on through the lens into the vitreous while the small pieces were caught in the iris (sifted out by the iris) where they remained.

12. Small pieces that are behind the iris are difficult to remove by means of the giant magnet. Under its attraction the foreign body will cause the iris to bulge up or be dragged one way or the other, but they will not cut their way through the iris. (An attempt has been made in Fig. 2 to show this lifting up of the conjunctiva when a small piece of steel under it is attracted by the magnet). This attempt at their removal will not only fail but the effort at removal will do great violence to the iris. A preliminary iridectomy, or at least iridotomy, should be performed, then a small hand magnet (the Hirschberg or other form) should be used in preference. This rule will apply also to small pieces under the conjunctiva. A small piece can be made to excavate its way around under the

conjunctiva without making its exit, the conjunctiva in the meantime being bulged up into a wavy cone. The tip of the Hirschberg magnet inserted through a slit in the conjunctiva is preferable to the giant magnet in such cases. Snipping the foreign body out with forceps and scissors in such a case, or touching the foreign body with a small cautery point and letting the foreign body come out on the eschar are equally successful ways of disposing of small pieces under the conjunctiva.

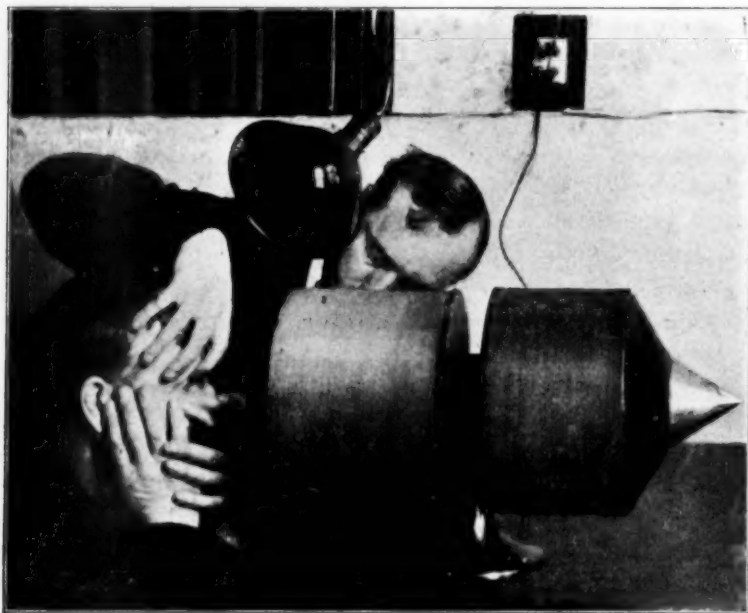


FIG. 2.

13. Large pieces may be made to perforate the iris or conjunctiva if they have a suitable shape and are managed properly.

14. Large pieces should have the current turned on slowly and time should be given them not only to find their point of least resistance and place themselves in proper position to avail themselves of it, but to cut their way. Fifteen or twenty minutes' application of the magnet may sometimes be necessary. Pieces weighing in the neighborhood of 2 cg. may be made to swim about in the vitreous in any desired direction.

15. Haab extracts foreign bodies from the vitreous by placing the point of the magnet at the sclero-corneal junction and causing the foreign body to roll around the edge of the lens and so on into position behind the iris or to come through a preparative opening made in the iris. Small pieces may perhaps be best extracted in that manner, but large pieces almost invariably do damage to the edge of the lens and to the iris. A better plan with large pieces, especially with those that have entered through the sclera without injuring the lens is, after locating them and arranging them in proper position for extraction, to make a hole in the sclera nearest to where they lie, if convenient, and extract them through the opening.

16. The best way for opening the sclera will often be with the galvano-cautery. It is less painful and seems to be less liable to sepsis. The slightly prolonged drainage afforded by it is often necessary for success.

17. If the operator is in doubt as to whether the size and shape and location of the foreign body render it suitable of extraction from the vitreous around the edge of the lens and through the iris, and he wishes to make a tentative trial of the magnet, instead of applying the tip of the magnet to the sclero-corneal junction, as recommended by Haab, a good plan is to remove the tip of the magnet and insert the eye into the opening at the end of the magnet as far as the sclero-corneal junction, applying the current slowly. Removing the eye from the magnet for repeated examination will enable the operator to determine what part of the ciliary region the foreign body will approach.

18. It is not always best to endeavor to remove the foreign body from the opening it has made in its entrance. Of course a foreign body that has passed through the cornea and iris and lens and remains in the back part of the vitreous would not be removed through the cornea. A ragged piece that has entered through the upper part of the sclera or ciliary body, but which lies in the lower anterior part of the vitreous, is often best removed through a cautery puncture in the lower part of the sclera.

19. The giant magnet forms a good means of determining whether the foreign body be free in the vitreous or not. If the attraction of the foreign body causes much pain the foreign body may be judged to be attached to the choroid and sclera.

Yet the giant magnet should seldom, if ever, be used for such purposes of diagnosis. Such haphazard application of the force is almost certain to displace the foreign body disadvantageously.

20. The writer is not experienced in the use of the sideroscope, but from the recent reports concerning it, it doubtless is far inferior to the modern X-ray appliances in determining the size, shape and location of a foreign body. In the writer's experience, however, fully half of the foreign bodies can be pretty definitely estimated by the ordinary means—ophthalmoscope, transillumination, etc.

21. The question of anæsthetics is one that must be settled by circumstances, that is to say, by the character of the patient and the conditions of the case. Blacksmiths, iron-moulders, saw-filers, and others, accustomed to getting pieces of iron or steel into the eye, can usually be relied upon to bear the pain and to place the eye in suitable position for the operation without an anæsthetic. Wood-choppers usually are not so tractable. In this wooded country where steel wedges and steel sledges are almost universally used in splitting logs, wood-choppers furnish a large quota of cases: Their eyes are seldom struck but when struck are injured badly. Large, sharp, jagged pieces from the edge of the hammer rebound from the wedge into the eye, where, in many instances, they pass entirely through the eyeball and lodge in the bone behind. Many of the cases of foreign bodies in the eyes of wood-choppers require general anæsthesia. If the foreign body is easily seen and promises to be easy of extraction cocaine anæsthesia will be sufficient. In some instances the writer has, without apparent detriment, fortified the cocaine with the use of the supra-renal gland extract. Where general anæsthesia is necessary, it should be profound, for the operator should have absolute control of the position of the eye for a sufficient length of time.

OPERATIVE TREATMENT OF HIGH MYOPIA.*

BY H. V. WUERDEMANN, M.D., MILWAUKEE, WIS.

THE author notes the advantage the German ophthalmologists have over Americans for observation of the myopic disease on account of the well known prevalence of myopia among the Germans. High degrees of myopia (over 12.0 D.) are even rare in America. He minutely describes two patients in whom the operation has been done with most satisfactory results.

CASE I.—Female, 20 years of age, whose refraction was:

R., — 16.00 \ominus — 1.50 ax. 180°, V. = $\frac{6}{xxxvi}$;

L., — 14.00 \ominus — 1.25 ax. 180°, V. = $\frac{6}{xxxvi}$;

and who complained greatly of smallness and distortion of images and inability to use the eyes for near work, even with much weaker myopic correction, was treated by discission of capsule and subsequent extraction of the lens-matter. The resulting refraction was:

R., + 1.00 \ominus + 2.00 ax. 115°, V. = $\frac{6}{xxiv}$;

L., + 2.00 \ominus + 3.00 ax. 75°, V. = $\frac{6}{xxiv}$;

with the addition of + 3.50 D. she was enabled to read small print and with distance glasses to read very well.

CASE II.—Male, whose refraction before operation was over 20.0 D., with correcting lenses he could only count fingers at ten feet. One eye was operated upon by two discissions with the result of enabling him to see small print without glasses at twelve inches and to see well with weak concave lenses in the distance.

The literature of the subject is freely quoted and exhaustively considered. The advantages, disadvantages and indications of the operation are fully discussed.

He concludes as follows:

1. Surgical treatment of myopia should be limited to cases over 12.0 D. who suffer great inconvenience from their correcting lenses.

*Abstract of paper read at the Fourth Annual Meeting of the Western Ophthalmological and Oto-Laryngological Association, held at New Orleans, La., February 10-11, 1899.

2. The operations are mainly indicated in young adults.
3. Cases having considerable changes in the ocular structures, such as progressive choroiditis, fluidity of the vitreous, or detachment of the retina, are not applicable for operation.
4. The dangers of operative interference are more than counterbalanced by the results to be achieved, which are: Increased visual acuity, enlargement of the visual field and extended use of the eyes, which accompany diminishment of the myopia.